DOCUMENT RESUME

ED 466 209 IR 021 280

AUTHOR	Ryan, Malcolm; Hall, Lynda
TITLE	eLearning, Teaching and Training: A First Look at Principles, Issues and Implications.
PUB DATE	2001-00-00
NOTE	8p.; In: ED-Media 2001 World Conference on Educational Multimedia, Hypermedia & Telecommunications. Proceedings (13th, Tampere, Finland, June 25-30, 2001); see IR 021 194.
AVAILABLE FROM	Association for the Advancement of Computing in Education (AACE), P.O. Box 2966, Charlottesville, VA 22902 ($40, AACE members; $50, nonmembers). Tel: 804-973-3987; Fax: 804-978-7449; Web site: http://www.aace.org.
PUB TYPE	Information Analyses (070) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Computer Uses in Education; Courseware; *Distance Education; *Educational Change; Educational Development; Educational Environment; *Educational Technology; Foreign Countries; Higher Education; Information Technology; Organizational Development; Technological Advancement
IDENTIFIERS	United Kingdom

ABSTRACT

Although it has yet to make a major impact on education and training in the United Kingdom, interest in eLearning is growing. To facilitate eLearning, a Virtual Learning Environment (VLE) is usually employed containing four main elements: courseware (self study learning materials, simulations, multimedia components); supporting materials (reference materials such as articles, case studies, books, World Wide Web links); online assessment (both formative and summative tests, quizzes and assignments); online support (via e-mail, computer mediated communication, chat rooms, bulletin boards). The means exist to create VLEs but if these are to become widespread in higher education, then a "cultural shift" will be needed--a shift away from a focus on teaching to a greater focus on learning. This raises a number of issues, including the attitudes and perceptions of a number of stakeholders, and has implications for institutions, the curriculum, staff, and students. These implications are explored in this article and point to a need for institutions to review current policies and practice if they wish to maximize the potential of eLearning. (Contains 17 references.) (AEF)

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ED 466 209

eLearning, Teaching and Training: a First Look at Principles, Issues and Implications

Malcolm Ryan, School of Post Compulsory Education and Training, University of Greenwich, UK.
m.ryan@gre.ac.uk

Lynda Hall, School of Post Compulsory Education and Training, University of Greenwich, UK.
l.hall@gre.ac.uk

Abstract: Although it has yet to make a major impact on education and training in the UK, interest in eLearning is growing. The means exist to create Virtual Learning Environments (VLEs) but if these are to become widespread in Higher Education then a "cultural shift" will be needed - a shift away from a focus on teaching to a greater focus on learning. This raises a number of issues - including the attitudes and perceptions of a number of stakeholders - and has implications for institutions, the curriculum, staff and students. These implications are explored in this article and point to a need for institutions to review current policies and practice if they wish to maximise the potential of eLearning.

The Context of Change

Changes in society are occurring on a global scale resulting in "a mass higher education system that is re-assessing its learning and teaching practices and exploiting the use of communication and information technologies." (Maier and Warren; 2000) A further consequence of these changes is that our clients (students) are demanding more flexible modes of study, just-in-time training, work-based learning and accreditation of prior experiential learning (APEL) whilst world-wide government initiatives continue to promote the concept of life-long learning. We are also told that Higher Education Institutions (HEIs) wishing to exploit technology effectively need "a clear and shared understanding of a wide range of issues - pedagogical, infra-structural and organizational." (Barblan and Fayant; 2000)

Many companies and large organisations also realise that they must continue to train employees if they are to remain competitive. Modern and dynamic companies no longer view training simply as a cost but more as an investment, linked to their ability to be both profitable and successful. However, traditional training methods tend to be very time consuming and are not particularly responsive to individual needs.

In addition to these changes, we have witnessed an unexpected and exponential growth and interest in the Internet and in the World Wide Web (WWW) in particular. Alongside eMail, eBanking, eCommerce and eShopping we now have eLearning and Teaching (ELT). eLearning is attractive to the corporate market "because it promises better use of time, accelerated learning, global reach, fast pace and accountability." (Cross, 2000)

What is eLearning?

In a very short space of time definitions of eLearning have mushroomed. These include, "the convergence of learning and networks and the new Economy," (Cross, 2000) and "the use of network technology to design, deliver, select, administer, and extend learning." (Masie, 2000) Goodyear (2000) is clear that eLearning is not just the equivalent of eCommerce or of learning on the Web but asserts that it is, "the systematic use of networked multimedia computer technologies to;

- empower learners,
- improve learning,
- connect learners to people and resources supportive of their needs, and
- integrate learning, performance, individual and organisational goals."

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He syggests that eLearning is essentially dependent upon, and shaped by, three enabling technologies; the infrastructure of the Internet, the presentational capabilities of modern multimedia computers and the information sharing tools and protocols of the world wide web (WWW).

Already, there are claims being made for eLearning and its ability to revolutionise education and training. Citing Cross (2000), legitimate eLearning is more likely to:

- focus on the needs of the learner, not the trainer or institution,
- take advantage of the net: real-time, 24/7, anywhere, anytime
- bring people together to collaborate and learn
- personalize, often by combining 'learning objects' on the fly
- offer more than one learning method
- incorporate administrative functions such as registration, payment ... monitoring learner progress, testing, and maintaining records.

So, whilst it is still a relatively new concept, currently eLearning appears to be characterised by the exploitation of Web based technologies to create learning materials and for course delivery, accessed via a browser with some form of on-line learner support

Implementing eLearning

To facilitate eLearning, a Virtual Learning Environment (VLE) is usually employed containing four main elements:

1. courseware – self study learning materials, simulations, multi-media components
2. supporting materials – reference materials such as articles, case studies, books, World Wide Web links
3. on-line assessment – both formative and summative tests, quizzes and assignments
4. on-line support – via e-mail, Computer Mediated Communication (CMC), chat rooms, bulletin boards.

At one level such an environment can be the extension of an existing Intranet (Fig. 1) that will usually contain three of the above components.

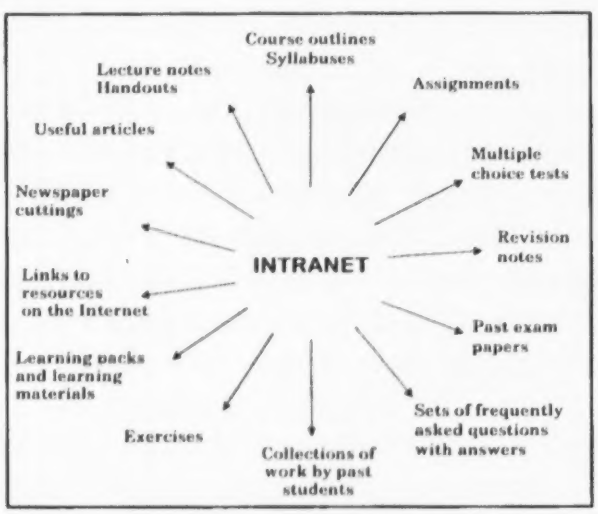

Figure 1 - Elements of an Intranet (based upon a figure in FEFC, 1998)

The missing element, on-line support, is often provided by e-mail or some form of bulletin board. As an interim arrangement this may work satisfactorily but a true VLE will integrate these functions fully and provide more sophisticated support, tracking and assessment tools.

Issues

Whilst the use of Virtual Learning Environments can provide a much enhanced 'distance learning experience' (Ryan, 1997) and reach new markets, there are also some drawbacks. Many of these can be partially addressed through training and support (Rogers, 2000) but unless a student has frequent and regular access to the technology and the necessary range of skills to exploit it, then they are likely to have an unsatisfactory learning experience. It is questionable, for example, whether all subjects can be delivered satisfactorily at all levels, to all students. It is relatively difficult at this time to provide the kind of 'hands-on' experiences via the Internet that may be gained in a science laboratory, engineering workshop or training kitchen. It is relatively easy on the other hand to present content-laden subjects and conceptual ideas via the Internet but, for the moment, many kinds of social interaction are probably still best experienced in face-to-face classrooms. Some commentators recommend a mixture of more traditional and eLearning approaches that acknowledge the diverse range of learning styles and subject matter in order to achieve maximum effectiveness.

A major area of concern reported by many researchers and practitioners (Ben-Jacob et al, 2000; Laurillard, 1995; Rogers, 2000; Ryan, 2000, Smith and Hardaker, 2000) is cultural shift. This 'shift' has a number of facets, some more tangible than others, but can be broadly described as a move away from teacher-centred, didactic exposition to a more resource-based, immersive and learner-centred environment. It would be dangerous to assume that all students will welcome this shift of emphasis away from teaching towards learning. Whilst many have responded positively to the use of ICT and VLEs in particular, (Birbeck, 2000; Smith and Hardaker, 2000) there are those who are sceptical and believe that flexible learning approaches are an abrogation of responsibility by the teacher. (Halsall, R. et al, 1998) It is certainly our experience (Ryan and Woodward, 1998) that more is expected of students and tutors operating virtually than within a traditional distance regime and this does not always suit all participants. It is important to introduce students (and staff) to this new way (culture) of learning and teaching, including how to learn (and teach) within a virtual learning environment.

The design of VLEs tends to promote the concept of a community of learners and opens up possibilities for networking, peer interaction and collaboration at a level not often seen in traditional classrooms. (Barajas, 2000) Interaction is at the heart of learning with ICT and the skills and attitudes required to make most effective use of VLEs are likely to be distinctly different to those normally operating within a traditional higher education institution. (Ben-Jacob, 2000; Rogers, 2000)

In turn, this cultural shift raises a number of issues for both students and tutors including:

- perceptions of learning and teaching
- attitudes towards being 'required' to learn as well as being taught
- the ICT skills required to operate efficiently
- ownership and control of learning and teaching
- the respective roles and relationships between stakeholders

No matter how far down the eLearning road one travels, the above issues (and others) will need to be considered and appropriate strategies developed for meeting the needs of users. Of paramount importance is the issue of staff development. "Academic staff development in the pedagogical applications of new technologies is fundamental to the transformation of teaching and learning ..." (Sprat et al, 2000)

Implications

Given the issues raised above, any institution or training organisation would be advised to review its current policies and practices if it is to maximise the potential of eLearning. There is a wealth of material in the public domain that outlines good practice and indicates what steps need to be taken to replicate that practice and address issues and potential problems. What follows is not an exhaustive list but is intended to provide a starting

point for considering the large number of factors that will impact on all stakeholders engaged in eLearning and Teaching (ELT).

Institutional

As suggested by Barblan and Fayant (2000), an audit of current practice across the organisation with regard to the use of ICT and learning, teaching and training strategies is a good place to begin the review process. Part of this review should include an ICT staff audit to establish levels of competence. This will provide a substantial amount of information about current operating practices and also give some insights into the prevailing culture. It is quite likely, for example, that an organisation familiar with more traditional teaching and training strategies will need to develop a new vision for the future which is student (client) rather than teacher or institution-led and this information will be helpful in developing an ELT policy. It will also be necessary to establish and maintain a stable telecommunications/networking infrastructure that will be future-proof. For eLearning to be as significant as on-campus provision there needs to be a greater emphasis on (and more resources devoted to) ICT infrastructure. The initial costs of ELT are high and financial resources will need to be committed to on-going development and maintenance.

Rome was not built in a day and any organisation intending to move into the eLearning world should consider developing short, medium and long-term plans for the implementation of ELT. Incremental change is far more likely to produce the required shift in culture than a full-frontal onslaught. It may be helpful, and promote a greater sense of ownership, if individual schools, faculties and departments are charged with incorporating ELT in all future strategic plans.

It is well known that the exploitation of ICT in learning, teaching and training requires a multi-disciplinary approach. Establishing a centre of expertise, if one does not already exist, which can become a one-stop shop for all matters relating to ELT would enable the range of expertise necessary to make most effective use of the technology accessible to the majority of stakeholders.

Although major software houses make wide ranging claims for their products it is acknowledged by practitioners that no one tool will deliver everything necessary for a fully functional VLE. It is better to identify and establish an eToolkit (a range of tools) that will deliver the organisation's policy on ELT rather than trying to use a 'hammer to drive a screw'. This toolkit may be based on one of the major VLE platforms such as Lotus LearningSpace or WebCT but should also include a number of specific tools for web audio and video streaming. This will allow a greater range of learning, teaching and training strategies to be employed within the virtual learning environment.

Although an ICT audit of staff may reveal them to be competent users they are still likely to require additional support to enable them to more fully exploit the potential of the selected eTools. It is advisable to provide a comprehensive staff development programme ranging from awareness raising to the design, development and exploitation of VLEs and the ELT toolkit. Alongside this provision there should be a range of user-support mechanisms both on and off campus for hardware, software, authoring and design. Consideration should be given to strategies that encourage greater collaboration/co-operation between schools and departments so that expertise is shared for the common good. One approach to providing on-going support and leadership might be the appointment of school/department-based ELT experts from amongst the 'ranks' to act as consultants and co-ordinators at a local level. Teaching and training within a VLE often occurs outside of 'normal' working hours. Tele-working is a legitimate method of operation and institutions may need to review staff contracts in the light of requirements for more flexible use of time – e.g. a longer teaching year, evening and weekend work.

In addition to the above, institutions will also have to develop an eLibrary, a comprehensive range of e-student support services and ensure that there are safeguards in place and a fallback position to support students when the technology fails. It may also be necessary to review regulations governing registration, assessment and accreditation to provide greater client orientation (flexibility) that facilitates just-in-time training and life-long learning. Some organisations will be better equipped than others to embrace these changes but whatever their position in the global market place everyone will benefit if future ICT developments in learning and teaching are grounded in sound educational practice, documented, evaluated and published.

Curriculum

The traditional offerings of universities and training organisations will need to be reviewed in the light of the changing market-place with its greater emphasis on, 'just-in-time' training, life-long learning, work-based training, mentoring and key skills. There is a worldwide shift towards more consumerism in education and training with its associated increase in client-centred content and greater involvement of the student/trainee (consumer) in determining outcomes and methods of assessment. To ensure that products are accessible and appeal to a worldwide audience institutions will have to conduct more in-depth market research. The delivery of these new curricula will have to become more flexible in terms of time and place with students operating outside of 'normal' university semesters.

Because eLearning is still in its infancy there are as yet no identified or established models to inform curriculum development. Some exist with regard to the use of ICT generally and computer mediated communication (CMC) in particular (e.g. Mason, 1998; Ryan, 1997). The articulation of such models will be helpful in the medium to long term and avoid much duplication of effort whilst building upon what we already know about the impact of ICT on learning and teaching.

One major difference between ICT-based and traditional learning, especially at a distance, has been the collaborative nature of much of the interaction and the extent to which the peer group supports one another and uses the tutor as a facilitator rather than a content-expert. Combined with market forces this shift in emphasis, from teaching to learning, may well lead to the greater involvement of a range of stakeholders (students, employers, industry, and the community) in the development of new courses and programmes.

An added bonus of working within a VLE is that students must make effective use of a range of ICT tools that can result in the acquisition and development of essential and transferable key skills. Programmes of study that are delivered within VLEs must ensure that there are opportunities within the curriculum to acquire and develop these skills or some students (those who enter with the skills) will have an unfair advantage over those who do not possess them.

Research has shown that novel ways of learning and teaching are possible when we employ ICT tools. What we have learnt about the use of these tools and the opportunities they provide should be fully exploited within VLEs so that the widest possible range of learning, teaching and training facilities are made available.

Students

Much of what has been said about the curriculum will impact directly upon students. Institutions should consider the likely impact that technology will have on students and be prepared to raise their awareness of the differences between traditional and eLearning and Teaching. Many students, for a variety of reasons, may have had limited exposure to the full range of ICT tools. Some students may have had limited access to the technology and only a minority are likely to have experienced operating within a virtual environment. If eLearning is to be successful then institutions must consider how students will gain regular and frequent access to appropriate technology, which may include home access via cable and satellite television and personal computer/communications devices such as laptops, handheld computers and WAP phones.

Alongside the traditional skills and abilities of students such as reading, writing, speaking and processing information it will be necessary for them to acquire and develop additional skills to fully exploit ELT. These will include using a wide range of ICT tools, time management and reflection both on and in action. For some students used to operating in isolation within a traditional distance context, they will also need to learn to collaborate and support their peers. Students may also need to modify their expectations of the tutor especially if they perceive them as being the 'sage on the stage' as they in turn adapt to their new role as 'guide on the side'.

Because eLearning is so technology-dependent, it is essential that there are clearly established lines of communication and support to ensure that students are not disadvantaged in the event of technology failure. It may be necessary to provide a full range of support mechanisms accessible 24 hours a day, 7 days a week to make most effective use of ELT. Within most UK universities this would be considered as an unusually high level of 'customer care'. However, with changed expectations about the learning and teaching processes and the

role of the technology, it is likely that new ways of thinking about how we perceive students and how they perceive teachers will need to be adopted.

Staff

Perhaps the greatest first step for academic staff and trainers will be the need for an increased awareness of the cultural shift from learning to teaching alongside embracing what technology has to offer. Staff development may help to facilitate aspects of this shift but there will need to be a fundamental belief in these new ways of working if they are to impact significantly on current practices. Training in the use of a range of ICT tools and their appropriate exploitation is but a small part of the overall staff development package that will need to be on offer and willingly embraced.

If full use is to be made of the novel opportunities provided by the technology then teachers and trainers will require time to translate existing and develop new courses for delivery within a VLE. Scholarship is more critical within an ELT environment (where expectations about currency are higher) and tutors will need time to undertake appropriate research to identify current and relevant resources to ensure those materials are always up-to-date. It is probably the case that most UK academics already have access to a dedicated computer, which will be essential if they are to exploit ELT effectively. There may also be a need to review timetabling to ensure greater cost-effective and efficient use of academics engaging in both traditional and ELT. Consideration may need to be given to alternative methods of allocating tutors to students e.g. case-loading. Terms and conditions of employment are different across the world but many UK HEIs operate on the basis of 'contact' hours. Such a basis for allocating time is probably inappropriate within a VLE and staff must be willing to be involved in a review of contracts with regard to working outside of 'normal' institutional hours, days and semesters.

The same need that students have for technical and user support will also apply to staff if they are going to be able to function effectively at all times. Additionally, it will be necessary to provide effective and efficient administrative support both centrally and locally to ensure an effective VLE.

Concluding Remarks

This paper has attempted to begin the process of raising awareness to the emerging nature and concept of eLearning and some of the issues and implications for learning, teaching and training within a virtual learning environment.

If eLearning is to be successful then it will be important for everyone involved to recognise and prepare for the cultural shift that underlies this revolution in learning, teaching and training. We should be wary of thinking of this new concept from a purely technological stance, a mistake made by many of the innovators and early adopters of ICT in learning and teaching. Instead, we should be guided by the outcomes of research and evaluation, which propose that we exploit the unique qualities of these technologies to enable new and diverse ways of supporting learning and always ensuring 'fitness for purpose'. (Laurillard, 1995)

Change does not mean turning our backs on tried, tested and successful models of learning and teaching. To jump on the technological bandwagon and try to deliver everything via the web would be a mistake. Web technologies are still evolving. They are in their infancy and whilst great strides have been made over recent years they probably have a long way to go before they mature – if indeed they ever do before we are overwhelmed by the next technological breakthrough!

The degree to which an institution is able to prepare all participants for this shift of emphasis and address the issues and concerns of all parties will inevitably determine the success of any project, including that of a virtual university. Staff development will be a major contributor to addressing these issues for tutors, alongside on-going support and development by key personnel. Steps must also be taken to ensure that students are supported through this transition from traditional to virtual learning and teaching or institutions risk losing their share of the growing eLearning market. In a virtual learning world there must be some compelling reason for a student to be persuaded to undertake a course of study at one institution rather than another.

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